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10/764,178

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12/21/2005

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EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--|--|--|
| Office Action Summary | Application No. 10/764,178 | Applicant(s) OGAWA, TSUYOSHI | |
| | Examiner Michelle R. Connelly-Cushwa | Art Unit 2874 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 10-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-9 in the reply filed on December 5, 2005 is acknowledged.

Claims 10-19 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

Twenty (20) sheets of formal drawings were filed on January 23, 2004 and have been accepted by the Examiner.

Specification

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Ghezzi et al. (US 5,367,584).

Regarding claim 1; Ghezzi et al. discloses an optical waveguide switch (see Figures 1a and 1b), the switch comprising:

- a plurality of optical waveguides (3, 11) including at least two layers having an interlayer spacing kept for not permitting a spontaneous occurrence of a proximity effect perturbation;
- gap section (8) formed in a predetermined axial length between paired upper and lower optical waveguides (11 and 3, respectively); and
- an optical waveguide drive (electrodes, 5 and 6) for driving at least one of the paired optical waveguides (11) to move toward the other optical waveguide (3) facing the optical waveguide within the gap section (8);
- wherein switching or translation of optical signals propagating through the optical waveguides takes place by coupling the optical waveguides with each other through movement of the optical waveguides within the gap section by the optical waveguide drive to a position where the proximity effect perturbation occurs (see Figure 1b).

Regarding claim 2; the optical waveguides includes a plurality of optical waveguides (3 and 11) formed in parallel within a same layer, and the optical waveguides within the same layer are simultaneously movable by the optical waveguide drive toward the optical waveguides formed in the opposite layer (see Figures 3a and 3b).

Regarding claim 4; the optical waveguides (3 and 11) are isolated from each other through a photoconductive intermediate layer (9) of a thickness substantially equal to the gap section (8) with exception to an area where the gap section is formed.

Regarding claim 5; the intermediate layer is formed with photoconductive material (9) whose refractive index is approximately equal to that of a clad material of the optical waveguides.

Regarding claim 7; the optical waveguide drive includes electrode layers (5 and 6) formed with a photoconductive electrode material facing each other and formed on optical waveguides (3 and 11) opposing each other, within the gap section (8), the optical waveguide drive causing an electrostatic force between the electrode layers by application of a drive voltage to move the optical waveguides (11) by the electrostatic force to a position where the proximity effect perturbation arises (see Figure 1b).

Regarding claim 8; at least one of the electrode layers (5) has a short-circuit proof layer (7) formed on a surface thereof.

Regarding claim 9; the optical waveguide drive makes the optical waveguides facing each other move at least to both a position where the optical waveguides having contact with each other and an intermediate position where the proximity effect perturbation arises (the optical waveguide, 11, moves through the intermediate position when actuated).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Ghezzi et al. (US 5,367,584) in view of Berger et al. (US 2003/0223675 A1).

Regarding claim 3; Ghezzi et al. discloses all of the limitations, except for an optical waveguide of an intermediate layer being selectively moved by the optical waveguide drive toward an optical waveguide formed in an upper or lower layer facing the intermediate-layered optical waveguide. Ghezzi et al. teaches that the switch may alternatively be configured vertically or horizontally (see column 5, lines 24-33). A vertically configured switch is pictured in Figures 1a and 1b.

Berger et al. disclose an optical switch in Figures 1A, 1B, 2A and 2B that is similar to the switch disclosed by Ghezzi et al. in that a first optical waveguide (26) deflects downward through an air gap to a second optical waveguide (24) for optical switching to occur. In Figures 9A and 9B, Berger et al. further discloses that the optical switch may include a horizontal configuration in which an intermediate waveguide(146) may be deflected towards either of the other two waveguides (144 and 148). Given the teaching of Ghezzi et al. that vertical configurations are an alternative to horizontal configurations, and the similarity of the optical switches, one of ordinary skill in the art would have found it obvious to either form the horizontal switch of Berger et al. in a vertical configuration or to form the vertical switch of Ghezzi et al. with an intermediate waveguide that may be selectively moved by the optical waveguide drive toward an

optical waveguide formed in an upper or lower layer facing the intermediate-layered optical waveguide.

Allowable Subject Matter

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claim 6 distinguishes over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide switch as defined in claim 6, wherein the gap section is filled with liquid.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claim 6.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Ghezzi et al. (US 5,367,585); Childers (US 6,832,015 B2); Berger et al. (US 6,839,479 B2); and Haronian (US 2003/0108274 A1) each disclose optical waveguide switches that deflect optical waveguides.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

A handwritten signature in black ink, reading "Michelle R. Connelly-Cushwa". The signature is written in a cursive, flowing style.

Michelle R. Connelly-Cushwa

Patent Examiner

December 16, 2005